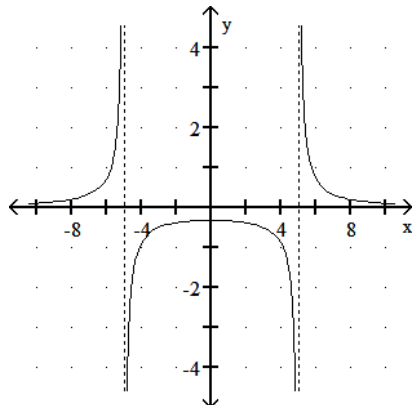


Use the given graph to find the indicated limit.

1)



$$\lim_{x \rightarrow 5^+} f(x)$$

- A) 0 B) 5 C) $-\infty$ D) ∞

1) _____

Provide an appropriate response.

2) If the limit at infinity exists, find the limit.

$$\lim_{x \rightarrow \infty} \frac{3x^3 + 5x}{4x^4 + 10x^3 + 2}$$

- A) 0 B) 1 C) ∞ D) $\frac{3}{4}$

2) _____

Solve the problem.

3) If an object moves along a line so that it is at $y = f(x) = 3x^2 - 2x + 5$ at time x (in seconds), find the instantaneous velocity function $v = f'(x)$.

- A) $6x - 2$ B) $6x^2 - 2$ C) $3x^2 - 2$ D) $3x - 2$

3) _____

Provide an appropriate response.

4) Find the derivative of $y = \frac{3x^5 - 7x^2 - 4}{x^2}$.

- A) $y' = 9x^{-2} + 8x^{-3}$ B) $y' = 9x^2 + 8x^3$
 C) $y' = 9x^2 + 8x^{-3}$ D) $y' = 18x^2 + 8x^{-3}$

4) _____

5) Find the equation of the tangent line at $x = 7$ for $f(x) = 6 - x^2$. Write the answer in the form $y = mx + b$.

- A) $y = -2x$ B) $y = -14x + 55$ C) $y = 7x + 55$ D) $y = 14x - 55$

5) _____

Find $f'(x)$.

6) $f(x) = -6 \ln x - x^5 + 3$

- A) $-\frac{6}{x} - 5x^4$ B) $-\frac{6}{x} - 5x$ C) $\frac{6}{x} - 5x^4$ D) $-\frac{1}{6x} - 5x^4$

6) _____

Find $\frac{dy}{dx}$ for the indicated function y.

7) $y = -5 \ln x + 9 \log_3 x$

A) $\frac{5}{x} + \frac{9}{x \ln 3}$

B) $-\frac{5}{x} + \frac{1}{x \ln 3}$

C) $-\frac{5}{x} + \frac{9}{x \ln 3}$

D) $-\frac{5}{x} + \frac{1}{x^9 \ln 3}$

7) _____

Differentiate.

8) $f(x) = (5x - 5)(5x^3 - x^2 + 1)$

A) $f'(x) = 100x^3 - 30x^2 + 90x + 5$

C) $f'(x) = 25x^3 + 30x^2 - 90x + 5$

B) $f'(x) = 100x^3 - 90x^2 + 10x + 5$

D) $f'(x) = 75x^3 + 90x^2 - 30x + 5$

8) _____

9) $f(t) = \frac{4t}{t^2 - 7t - 3}$

A) $f'(t) = \frac{-4(t^2 + 3)}{(t^2 - 7t - 3)^2}$

C) $f'(t) = \frac{-4t^2}{(t^2 - 7t - 3)^2}$

B) $f'(t) = \frac{-4(t^2 - 7t + 3)}{(t^2 - 7t - 3)^2}$

D) $f'(t) = \frac{4}{2t - 7}$

9) _____

10) $g(x) = \frac{x^2}{x - 11}$

A) $g'(x) = \frac{x^2 + 22x}{(x - 11)^2}$

C) $g'(x) = \frac{22x}{(x - 11)^2}$

B) $g'(x) = \frac{x^2 - 22x}{(x - 11)^2}$

D) $g'(x) = \frac{x^2}{(x - 11)^2}$

10) _____

11) $f(x) = (3x + 7)^5$

A) $f'(x) = 15(3x + 7)^4$

C) $f'(x) = 5(3x + 7)^4$

B) $f'(x) = 3(3x + 7)^4$

D) $f'(x) = 15(3x + 7)^5$

11) _____

Find the relative extrema of the function, if they exist.

12) $f(x) = x^3 - 3x^2 + 1$

A) Relative maximum at (-2, -19); relative maximum at (0, 1)

B) Relative maximum at (2, -3)

C) Relative maximum at (0, 1); relative minimum at (2, -3)

D) Relative minimum at (0, 1); relative maximum at (2, -3)

12) _____

Find the absolute maximum and absolute minimum values of the function, if they exist, on the indicated interval.

13) $f(x) = x^3 - 3x + 5; [-3, 1]$

A) Absolute maximum: 7

B) Absolute maximum: 3, absolute minimum: 1

C) Absolute minimum: 1

D) Absolute maximum: 7, absolute minimum: -13

13) _____

Provide an appropriate response.

14) Determine the interval(s) over which $f(x) = x^3 - 3x$ is concave downward.

A) $(-\infty, 3)$

B) $(-\infty, 0)$

C) $(3, \infty)$

D) $(0, \infty)$

14) _____

Find the integral.

15) $\int (4x^{11} - 7x^3 + 7) dx$

A) $12x^{12} - \frac{7}{3}x^4 + 7x + C$

B) $12x^{12} - \frac{7}{4}x^4 + 7x + C$

C) $\frac{1}{4}x^{12} - \frac{7}{3}x^4 + 7x + C$

D) $\frac{1}{3}x^{12} - \frac{7}{4}x^4 + 7x + C$

15) _____

Evaluate.

16) $\int (x^6 + e^{3x}) dx$

A) $\frac{x^5}{5} + 3e^{3x} + C$

B) $\frac{x^7}{7} + e^{3x} + C$

C) $\frac{x^7}{7} + \frac{e^{4x}}{4} + C$

D) $\frac{x^7}{7} + \frac{e^{3x}}{3} + C$

16) _____

Find the integral.

17) $\int x^2 \sqrt{x^3 + 10} dx$

A) $-\frac{2}{3}(x^3 + 10)^{-1/2} + C$

B) $2(x^3 + 10)^{3/2} + C$

C) $\frac{2}{9}(x^3 + 10)^{3/2} + C$

D) $\frac{2}{3}(x^3 + 10)^{3/2} + C$

17) _____

Evaluate the integral.

18) $\int_{-2}^5 5x^4 dx$

A) 15,785

B) -3157

C) 133

D) 3157

18) _____

19) $\int_0^4 (x+1)^3 dx$

A) $\frac{625}{4}$

B) 624

C) 156

D) 72

19) _____

Find the total area of the region between the curve and the x-axis.

20) $y = x^2 - 6x + 9; 2 \leq x \leq 4$

A) $\frac{1}{3}$

B) $\frac{7}{3}$

C) $\frac{4}{3}$

D) $\frac{2}{3}$

20) _____

Answer Key

Testname: FINAL_REVIEW_MAC2233

- 1) D
- 2) A
- 3) A
- 4) C
- 5) B
- 6) A
- 7) C
- 8) B
- 9) A
- 10) B
- 11) A
- 12) C
- 13) D
- 14) B
- 15) D
- 16) D
- 17) C
- 18) D
- 19) C
- 20) D